

**REMARKS**

Claims 1-20 are pending. By this Amendment, claims 1 and 16 are amended. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

The Office Action objects to claim 16 for a minor informality. Applicants have amended claim 16 in accordance with the Examiner's recommendation and respectfully request withdrawal of the objection to this claim.

The Office Action rejects claims 1-4, 6, 7, 10, 13, 14, 17, 19 and 29 under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,047,074 to Zoels et al. (hereinafter "Zoels") in view of U.S. Patent No. 5,884,260 to Leonhard (hereinafter "Leonhard"). This rejection is respectfully traversed.

Claim 1 recites, *inter alia*, at least one acoustic sensor for picking up an acoustic signal and converting it into an electrical audio signal, an electronic signal processing unit for audio signal processing and amplification, an electrical power supply unit ... an actuator arrangement which is provided with at least one output actuator selected from the group consisting of electroacoustic, electromechanical, and purely electrical actuators, and any combination thereof, for stimulation of damaged hearing, wherein the signal processing unit has a speech analysis and recognition module and a speech synthesis module.

Zoels is directed toward a programmable hearing aid operable in a mode for tinnitus therapy. However, after carefully reviewing Zoels, Applicants can find no teaching, suggestion or disclosure of the signal processing unit having a speech analysis and recognition module and a speech synthesis module as recited in claim 1.

While the Examiner generally agrees that Zoels does not specifically disclose the above feature, the Examiner asserts that "these features were well know in the art, as taught by Leonhard."

Leonhard is directed toward a method and system for detecting and generating transient conditions in auditory signals. In particular, Leonhard relates to method of speech analysis, speech recognition and speech synthesis, wherein *only the transient part* of the auditory signal is used. In particular, as recited in the Abstract of Leonhard, "the invention further relates to a system for processing an auditory signal in order to reduce the bandwidth of the signal with substantial retention of the information of the signal, the system comprising

means for extracting *the transient component* of the auditory signal, and means for detecting an envelope of *the transient component*.”

However, Applicants respectfully submit that Leonhard fails to disclose that, although the methods of Leonhard may be used for speech recognition *or* for speech synthesis, the speech recognition and the speech synthesis are to be preformed in combination. Specifically, Applicants respectfully submit that Leonhard fails to disclose that first an auditory signal has to undergo speech recognition and thereafter is restored by speech synthesis based on the result of the speech recognition.

Furthermore, Applicants respectfully submit that Leonhard only teaches that the methods may be used for speech recognition or for quality measurement of audio products such as hearing aids. (See in particular column 1, lines 5-11 and claims 8, 32 and 85) Therefore, Applicants respectfully submit that Leonhard fails to teach that the speech recognition or speech synthesis is to be used in *combination* with a hearing aid.

Specifically, and in contrast, Leonhard clearly considers that the application of the general methodology of speech recognition, speech synthesis and quality measurement of hearing aids as alternatives.

Furthermore, Applicants respectfully submit that Leonhard does not provide for any teaching that the method of Leonhard may be implemented in a hearing aid, since the quality measurement of a hearing aid has nothing to do with the hearing aids usual use as a hearing aid by a patient.

Accordingly, Applicants respectfully submit that Leonhard does not provide any teaching to combine speech recognition and speech synthesis and to implement such a combined process into a hearing aid for creating a system for rehabilitation of a hearing disorder which is able to offer speech from which interfering noise has been at least largely removed at the output of the system. Therefore, Leonhard would not have prompted the skilled artisan to modify the digital hearing aid of Zoels by implementing a speech recognition module and a speech synthesis module within the signal processing unit of the hearing aid. In contrast, Applicants respectfully submit that the Examiner is relying on impermissible hindsight to combine the teaching of Zoels and Leonhard.

Specifically, “It is difficult but necessary that the decision maker forget what he or she has been taught . . . about the claimed invention and cast the mind back to the time the

invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984).

Nevertheless, to reach a proper determination under 35 U.S.C. 103, the examiner *must* step backward in time and into the shoes worn by the hypothetical “person of ordinary skill in the art” when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention. The tendency to resort to hindsight” based upon applicant’s disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

Accordingly, Applicants respectfully submit claim 1 is not rendered obvious by the cited references, either alone or in combination. Furthermore, claims 2-4, 6, 7, 10, 13, 14, 17, 19 and 29 are also not obvious in view of the cited references by virtue of the reasons discussed above, and the individual feature(s) recited therein. Accordingly, withdrawal of the rejection of these claims under 35 U.S.C. § 103(a) is respectfully requested.

The Office Action rejects claim 5 under 35 U.S.C. § 103(a) as being unpatentable over Zoels in view of Leonhard and further in view of the article by Markowitz (hereinafter “Markowitz”). This rejection is respectfully traversed.

The Examiner concedes that Zoels in view of Leonhard does not specifically teach “the speech analysis and speech recognition module and the speech synthesis module including a digitally implemented neural network.” However, the Examiner asserts this concept is well known as taught by Markowitz.

In contrast, Applicants respectfully submit that Markowitz does not suggest to one skilled in the art to implement speech recognition module and a speech synthesis module in a hearing aid. In particular, Applicants respectfully submit that mere fact that speech recognition and speech synthesis *per se* are known, would not have prompted the skilled

person to create a hearing aid with a speech recognition module and a speech synthesis module. In contrast, known hearing aids try to filter out noise information from speech information without genuine separation of speech information and noise information. Consequently, Applicants respectfully submit known hearing aids teach away from implementing speech recognition and speech synthesis within a hearing aid. In particular, Applicants respectfully submit that known teachings relating to speech recognition and speech synthesis do not relate to the field of hearing aids.

Accordingly, Applicants respectfully submit it would not have been obvious to the skilled person, in view of the cited references, to implement speech recognition and speech synthesis within a hearing aid. Accordingly, and based on the requirements for establishing a rejection based on obviousness under 35 U.S.C. § 103, Applicants respectfully submit the rejection of claim 5 is improper. Accordingly, withdrawal of the rejection of claim 5 under 35 U.S.C. § 103(a) is respectfully requested.

The Office Action rejects claims 8 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Zoels and Leonhard and further in view of U.S. Patent No. 5,933, 085 to Boss et al. (hereinafter "Boss"). This rejection is respectfully traversed.

The Examiner concedes that the cited references do not specifically teach "the speech analysis and recognition module has an arrangement for detecting and extracting additional prosody of the speech information, and wherein the speech synthesis module is provided with an arrangement for taken into account the prosody of speech information in speech synthesis. However, the Examiner asserts this concept is well known as taught by Boss.

Applicants respectfully submit, at least for the reasons outlined above, and the fact that Boss at least fails to overcome the deficiencies as noted above in relation to Zoels, and Leonhard, the references, either alone or in combination, fail to render obvious claims 8 and 9.

Accordingly, Applicants respectfully submit that the cited combination of references fails to teach, suggest or disclose each and every feature as recited in the claims. Accordingly, the cited references fail to render obvious or anticipate claims 8 and 9. Withdrawal of the rejection of these claims under 35 U.S.C. § 103(a) is respectfully requested.

The Office Action rejects claims 11, 12 and 15 under 35 U.S.C. § 103(a) as unpatentable over Zoels in view of Leonhard and further in view of well known prior art.

The Examiner concedes that “neither Zoels nor Zoels in view of Leonhard teach that the switching occurs “at a low level of interfering sound.”” However, the Examiner takes Official Notice of the fact that automatic switching of noise-reducing signal processing software is well known in the art.

Applicants respectfully submit that the cited references, in combination with the Examiner’s assertion of what is well known, at least fails to overcome the deficiencies as noted above in relation to Zoels and Leonhard. Accordingly, the cited references fail to teach, suggest or disclose each and every feature of claims 11, 12 and 15. Accordingly, the cited references fail to render obvious or anticipate these claims. Withdrawal of the rejection of claims 11, 12 and 15 under 35 U.S.C. § 103(a) is respectfully requested.

The Office Action rejects claims 16 and 18 under 35 U.S.C. § 103(a) as unpatentable over Zoels in view of Leonhard and further in view of U.S. Patent No. 5,608,803 to Magotra et al. (hereinafter “Magotra”). This rejection is respectfully traversed.

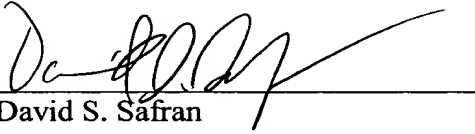
The Examiner concedes that Zoels in view of Leonhard does not specifically teach “a plurality acoustic sensors are provided, each of the acoustic sensors being upstream of an analog-digital converter. However, the Examiner contends this concept was well known in the art, as taught by Magotra.

Applicants respectfully submits that at least based on the deficiencies noted above in relation to Zoels and Leonhard, and the fact that Magotra fails to overcome these deficiencies, that the cited references, either alone or in combination, fail to render obvious or anticipate claim 16 and 18. Accordingly, withdrawal of the rejection of claims 16 and 18 under 35 U.S.C. § 103(a) is respectfully requested.

Applicant respectfully submits that the application is in condition for allowance.  
Favorable reconsideration and prompt allowance are respectfully requested.

Should the Examiner believe anything further is desirable in order to place the application in even better condition for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



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